

## CLAIMS

What is claimed is:

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1. A rotational angioplasty device comprising:

a handle housing;

10 a rotatable prime mover carried by a prime mover carriage which is disposed within the handle housing, the prime mover carriage being longitudinally movable with respect to the handle housing;

15 an exchangeable drive shaft cartridge removably attachable to the handle housing further comprising:

a tubular core element mounted within the cartridge;

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a longitudinally movable tube disposed within the tubular element and having a proximal end portion which is removably attachable to the prime mover carriage for longitudinal movement therewith;

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a rotatable flexible drive shaft having a proximal portion which is disposed within the longitudinally movable tube and a distal portion which includes a tissue removal implement, said proximal portion having a shank at its proximal end;

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into said index groove when said retention and index grooves are aligned;

wherein, in said aligned relation, the moveable tube and said proximal portion of said drive shaft are relatively positioned to allow rotation of said drive shaft within said moveable tube.

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2. A rotational angioplasty device, as described in claim 1, wherein said shank is constructed with a radial extending flange to engage abutment surfaces on said moveable tube during axial movement of said tube and wherein, in said aligned position of said retention groove and said index groove, said flange is disengaged from said abutment surfaces.

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3. A rotational angioplasty device, as described in claim 1, wherein said retention groove is constructed in said first coupling surface and said index groove is constructed in said second coupling surface.

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4. A rotational angioplasty device, as described in claim 1, wherein said retention groove is constructed in said second coupling surface and said index groove is constructed in said first coupling surface.

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5. A rotational angioplasty device, as described in claim 1, wherein said retention groove is constructed having rectangular cross section.

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6. A rotational angioplasty device, as described in claim 1, wherein said index groove comprises an area of

reduced diameter from said coupling surface defined by  
a first cam surface inclined from said area in a first  
axial direction and a second cam surface inclined from  
said area in a second axial direction, said second  
5 axial direction being 180° from said first axial  
direction.

7. A rotational angioplasty device, as described in  
claim 6, wherein said annular resilient element tends  
10 to be centered in said area of reduced diameter by the  
action of said radial spring force on said first and  
second cam surfaces.

8. A rotational angioplasty device, as described in  
15 claim 1, wherein said annular resilient element  
comprises a canted coil spring.

9. A rotational angioplasty device, as described in  
claim 1, wherein to operationally engage the removable  
20 drive shaft cartridge to the prime mover, said shank is  
first fully engaged with said prime mover, wherein, in  
such position, the annular resilient element is engaged  
with the most forward of said first and second cam  
surfaces to generate a force on said prime mover  
25 carriage to urge said prime mover carriage in a  
direction which tends to longitudinally align the  
annular resilient element with the index groove.

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